Space Weather Forecast

Issued on Tuesday, 28 November 2023 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of isolated M-class flares. Chance of G1-G2 Minor/Moderate storms with Coronal Mass Ejection arrival 29 Nov or early 30 Nov.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Activity has been Low, with only a number of C-class flares, the most energetic of these from the large and magnetically complex region in the southeast quadrant. This is one of eleven sunspot regions on the visible disc, with a number of moderately sized regions. In addition there is a proliferation of simple unipolar regions.

There are a number of filaments on the Earth-facing disc. These are lines of plasma held together by the Suns magnetic field, and can erupt to produce coronal mass ejections (CMEs). One such eruption occurred early on 27 Nov, and produced a CME which may arrive at Earth either late on 29 Nov or during 30 Nov. A further eruption in the eastern hemisphere will be analysed once sufficient satellite imagery becomes available.

Solar Wind / Geomagnetic Activity: Solar wind speeds have been at slightly elevated levels. Interplanetary Magnetic Field (IMF), was weak, with north-south component also weak and variable in direction. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be Low to Moderate, with a chance of isolated M-flares. A large and complex region in the southeast quadrant is most likely to produce energetic flares.

Solar Winds / Geomagnetic Activity: A CME which left the Sun on 27 Nov is forecast to arrive at Earth either late on 29 Nov or early on 30 Nov, but with current low confidence. A further CME from the eastern hemisphere will be analysed once further data becomes available. A fast solar wind is expected to ease through 28 Nov with background levels then forecast in the absence of the CME effects. Quiet with Unsettled intervals through 28 Nov and into 29 Nov. Active to G1/Minor Storm intervals are then possible late on 29 Nov and into 30 Nov due to the potential CME arrivals. A gradual return back to Quiet to Unsettled conditions are then possible on 01 Dec.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to stay at background, but there is the potential for an increase to be observed if any large flares or filament eruptions occur. This brings a slight chance of approaching, and perhaps exceeding, the S1 Minor Radiation Storm levels.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	20	40	10
Strong	G3	No	1	5	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	45	45	45	45
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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